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Hinzmann

[11] **4,063,480**

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[54] **APPARATUS FOR SEVERING ROD-SHAPED SMOKERS' PRODUCTS**

[75] Inventor: **Alfred Hinzmann**, Richmond, Va.

[73] Assignee: **Hauni-Werke Korber & Co., KG**, Hamburg, Germany

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[51] **Int. Cl.**[2] **B26D 7/14**; B26D 7/06; A24C 5/50

[52] **U.S. Cl.** ..... **83/176**; 83/17; 83/411 R

[58] **Field of Search** ..... 83/17, 18, 19, 175, 83/176, 411 R, 409, 410

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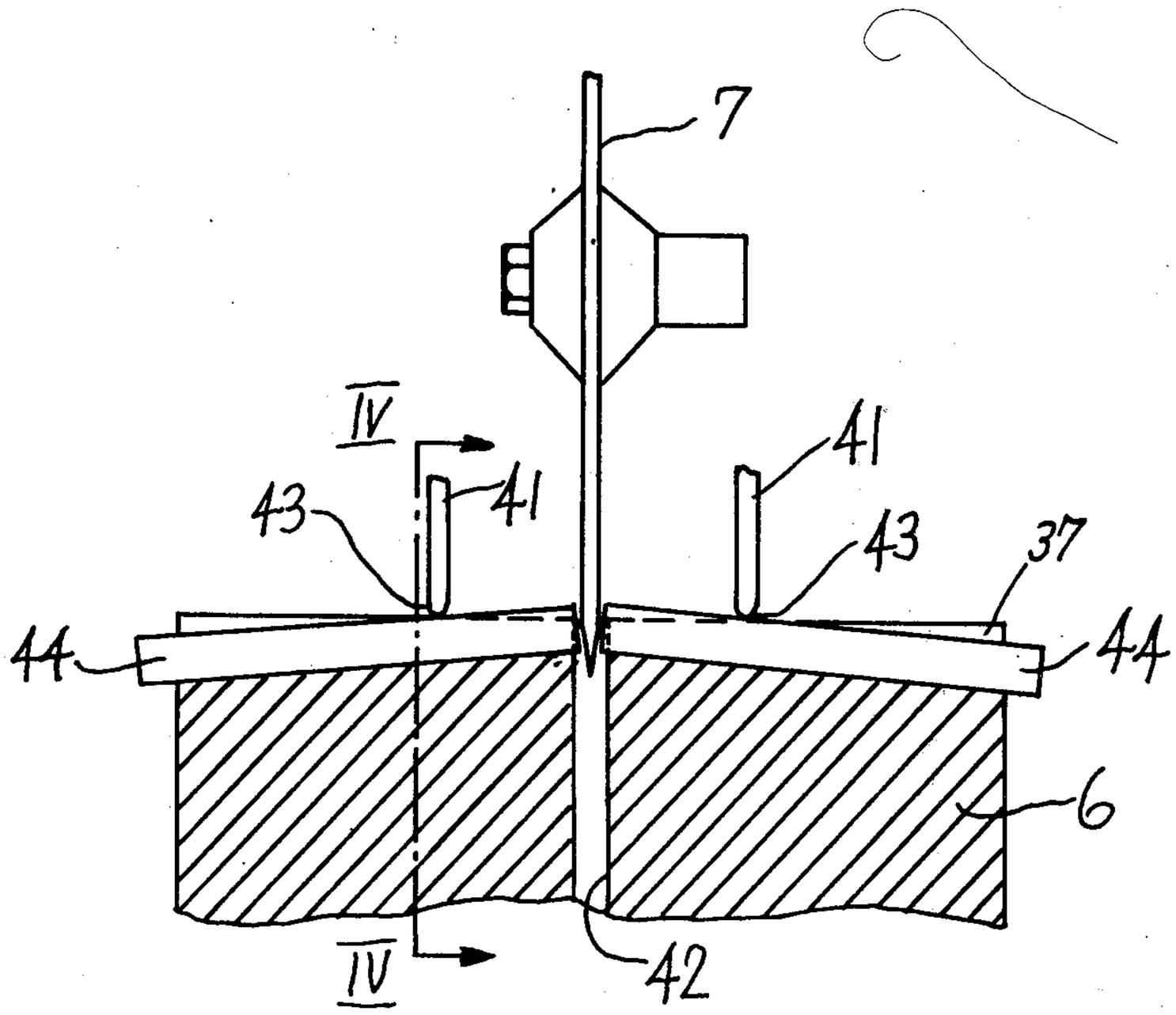
Primary Examiner—Donald R. Schran
Attorney, Agent, or Firm—Peter K. Kontler

[57] **ABSTRACT**

Filter rod portions in the flutes of a rotating drum are severed by a rotary disk-shaped knife to yield shorter sections which are used for the making of filter cigarettes. During severing, the filter rod portions are flexed by stationary components to produce tensional stresses in those parts of filter rod portions which move into the range of the knife. This enables the knife to make a clean cut and to become immediately separated from the shorter sections. The stationary components may include annular members which urge the outer parts of successive filter rod portions against sloping portions of bottom surfaces of the respective flutes. If the depth of the flutes is constant, the components further include stationary cams which extend into circumferential grooves of the drum and lift the central parts of successive filter rod portions out of the adjacent portions of the flutes during travel past the knife.

15 Claims, 7 Drawing Figures



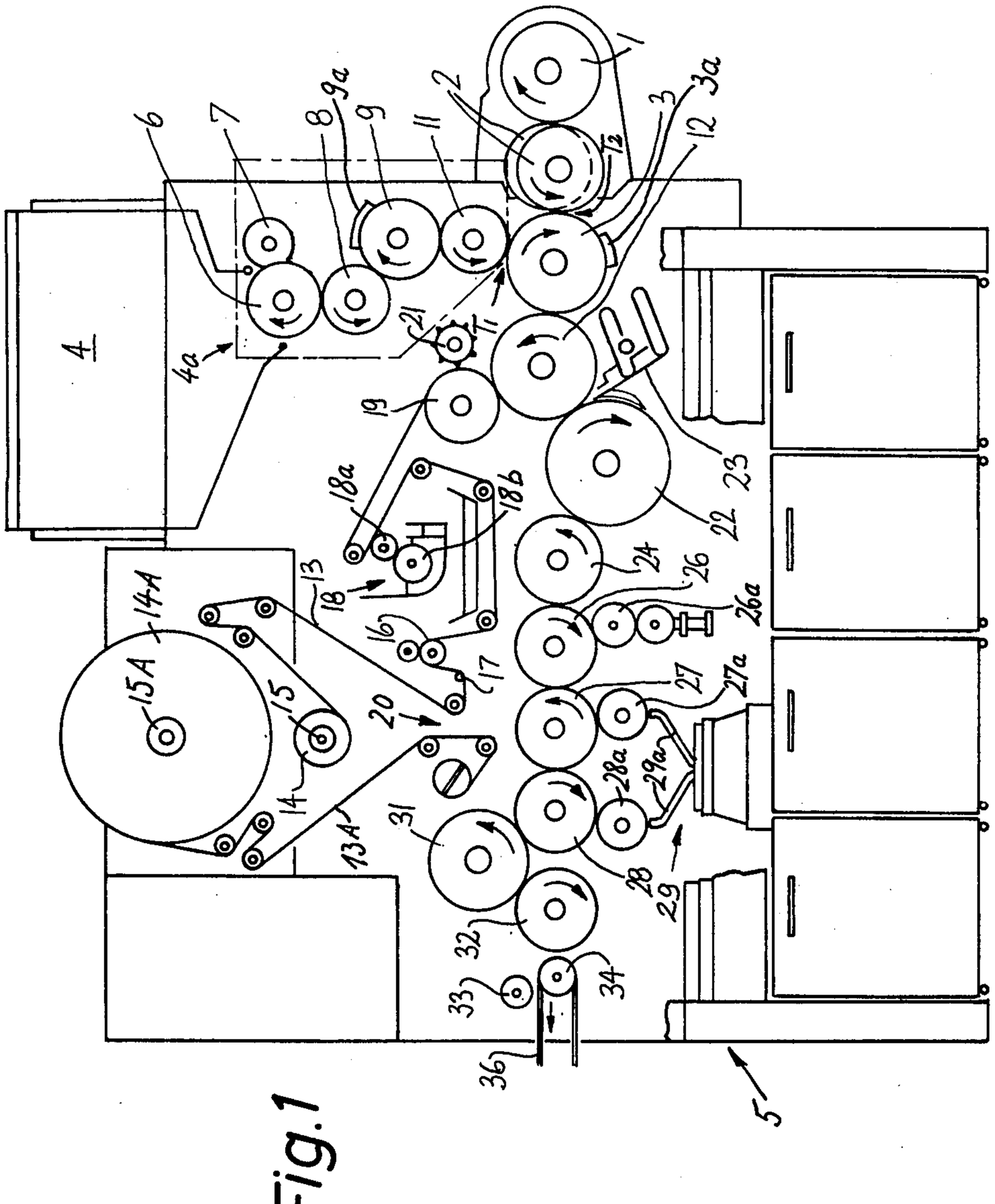

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Fig. 1

Fig.2

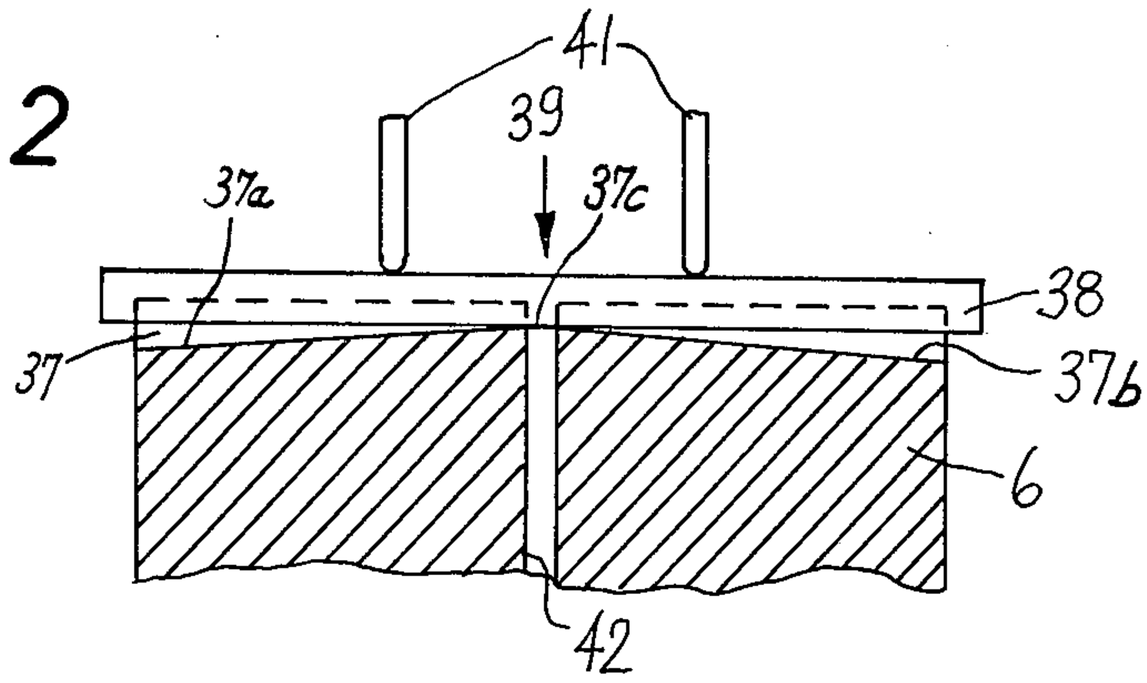

Fig.3

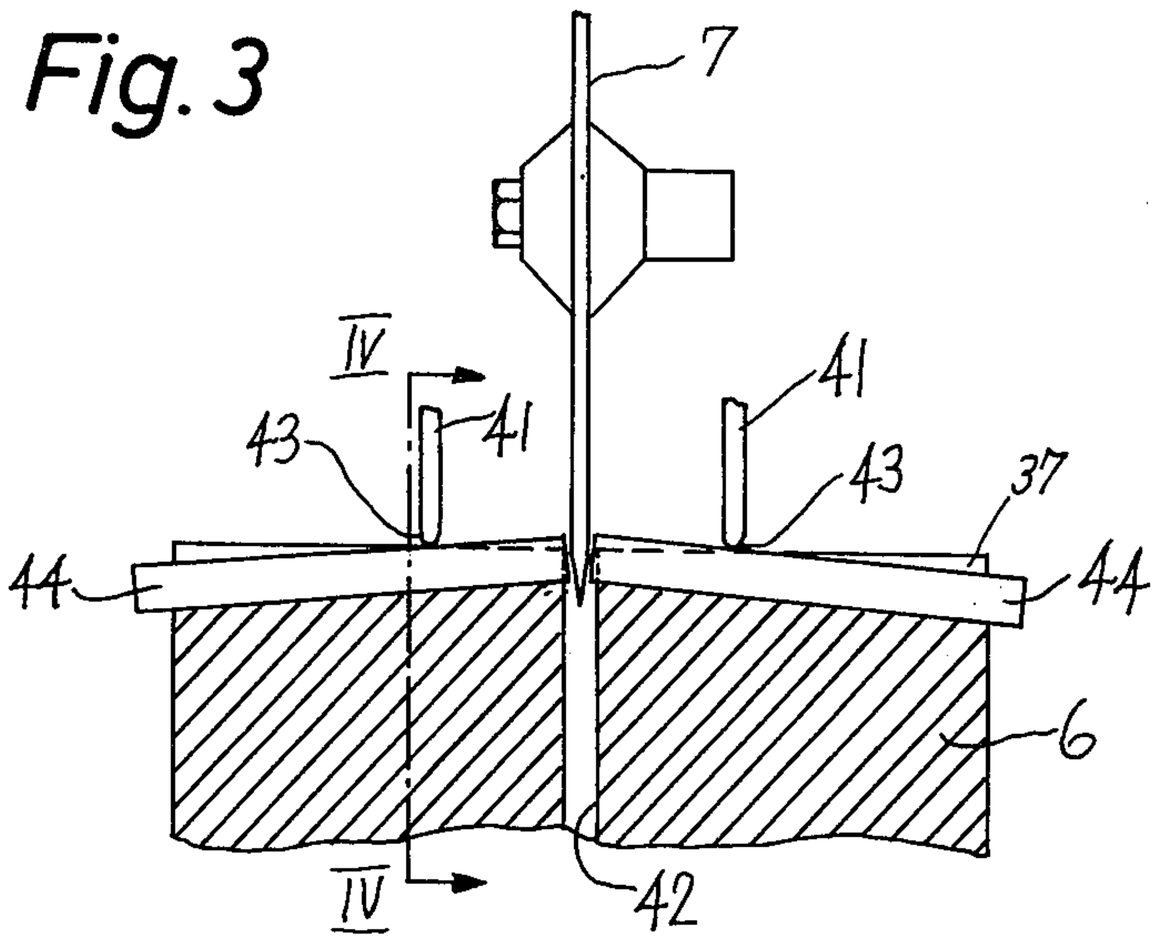

Fig.4

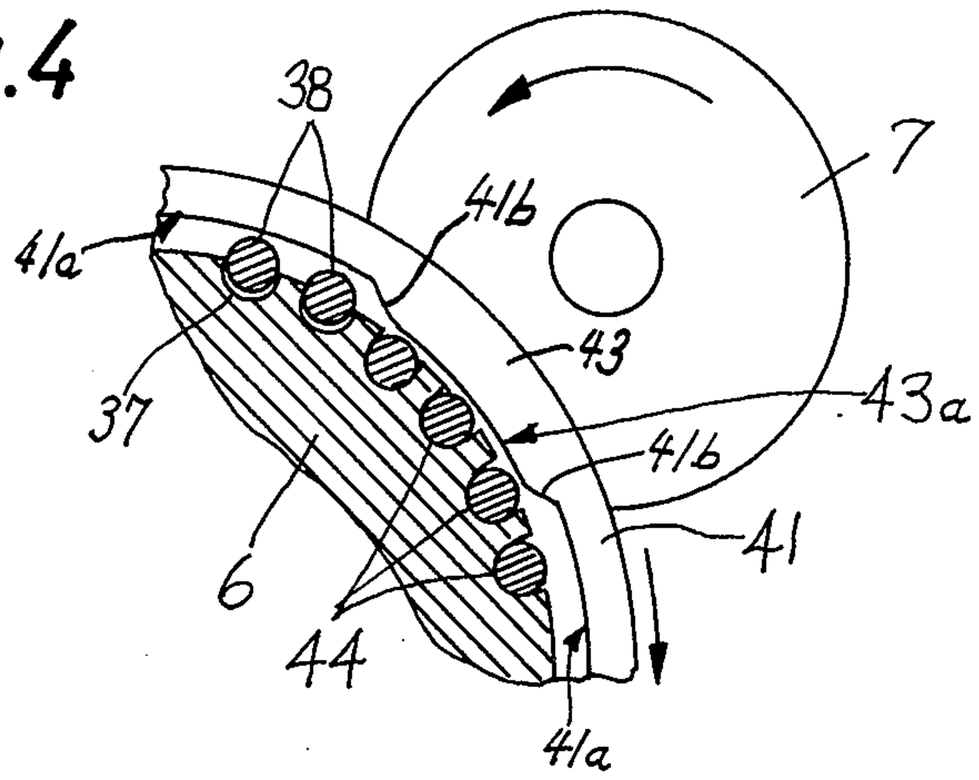

Fig.5

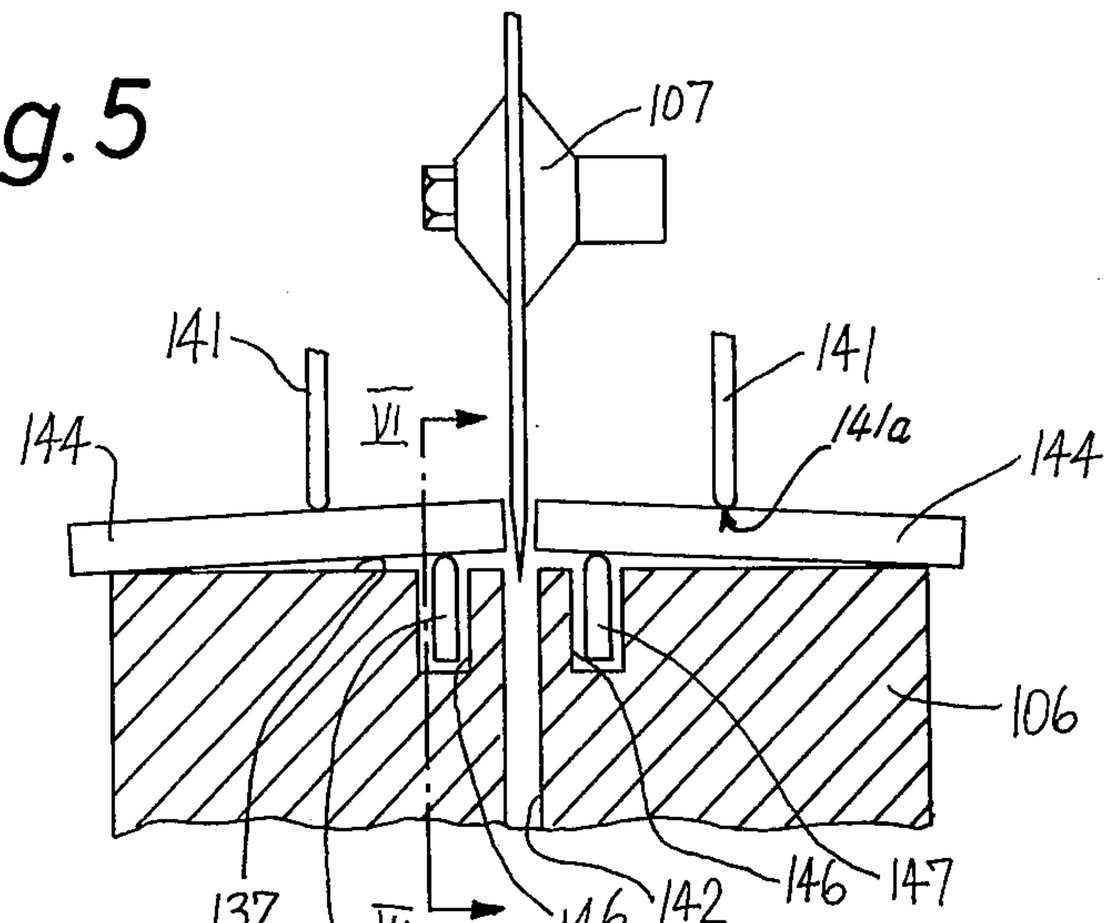
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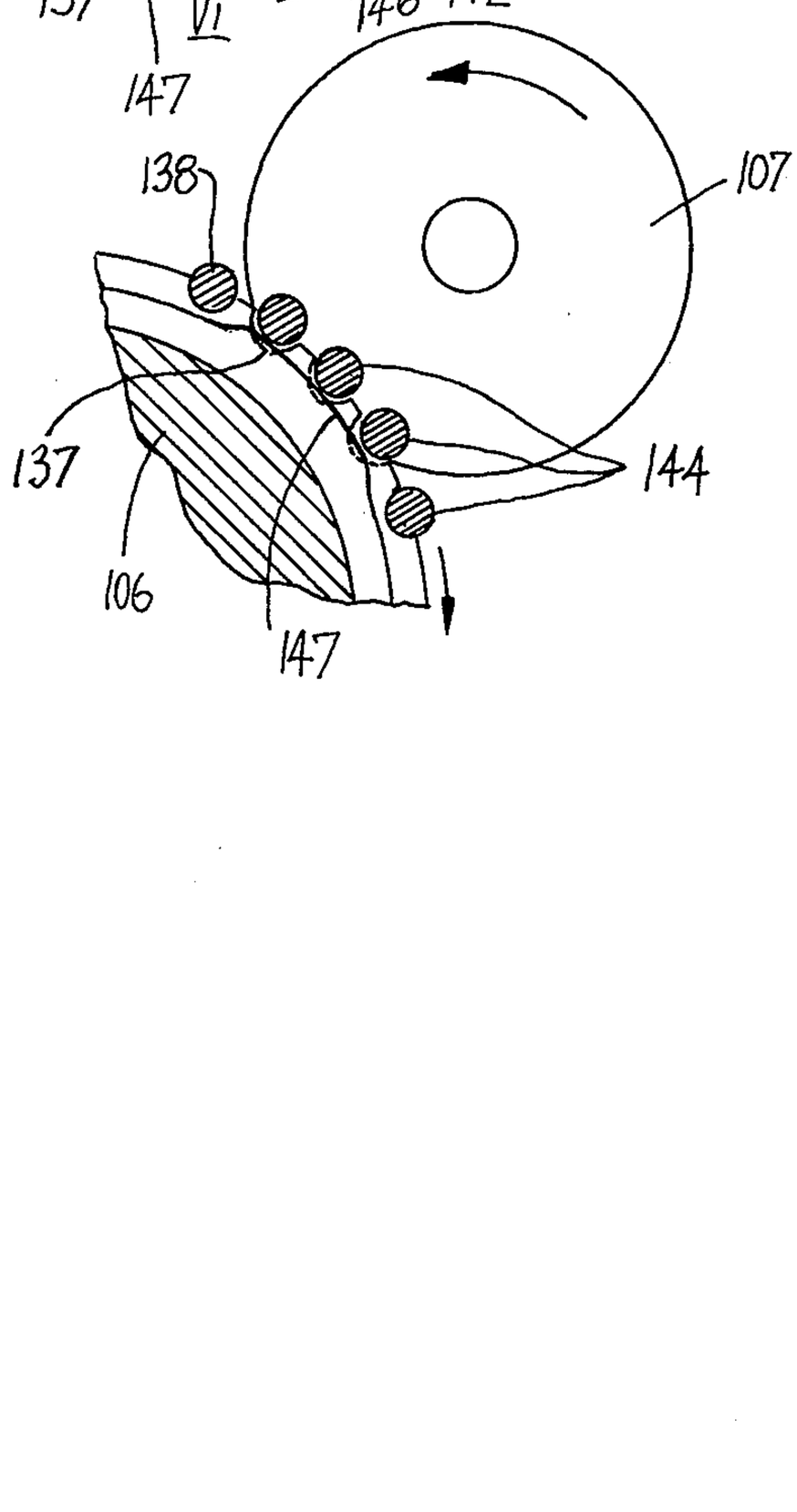
Fig.6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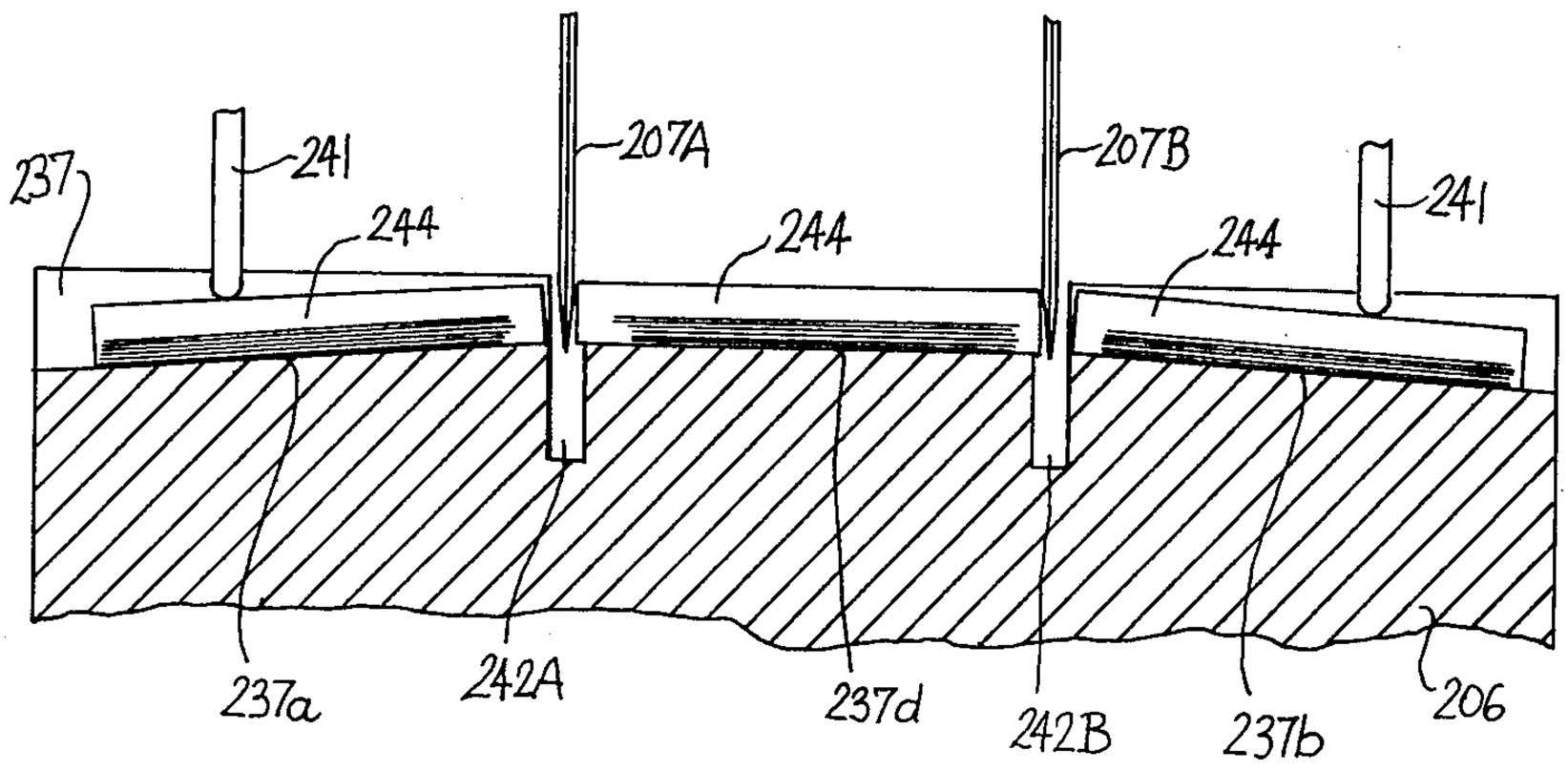

Fig.7

APPARATUS FOR SEVERING ROD-SHAPED SMOKERS' PRODUCTS

BACKGROUND OF THE INVENTION

The present invention relates to apparatus for severing or subdividing rod-shaped articles, particularly portions of filter rods or analogous articles which constitute or form part of smokers' products. Still more particularly, the invention relates to apparatus of the type wherein the articles to be severed are moved sideways past one or more rotating or orbiting knives which are located in planes extending at right angles to the axes of the articles.

It is known to sever portions of filter rods, e.g., filter rod portions of four times unit length, during transport form a magazine toward the assembly conveyor of a machine for the making of filter cigarettes, cigarillos or cigars. The filter rod portions are severed by a rotary disk-shaped knife so that each thereof yields two coaxial filter rod sections of two times unit length each of which is suited for assembly with two plain cigarettes of unit length of form therewith a filter cigarette of double unit length. The severing operation is rather simple if the filter rod portions consist of acetate filters surrounded by a wrapper made of cigarette paper, imitation cork or the like. Such filter rod portions are sufficiently soft to be severed by a rotary knife which can stand long periods of use and can form clean cuts across the wrappers as well as across the rod-like filter consisting of fibrous filter material. Problems arise when the filter rod portions consist of extruded profiled synthetic plastic material which exhibits little elasticity. Such material is rather hard and offers considerable resistance to severing so that the knife or knives must be driven by powerful prime movers and their cutting edges become dull after short periods of use. Moreover, the knife or knives become overheated as a result of friction between the sides of their cutting edges and the material of the filter rod portions. In many instances, the friction is high enough to cause the knife or knives to jam with resulting lengthy interruptions of operation and substantial losses in output, especially if the severing apparatus is used in a high-speed machine which can turn out up to and in excess of 4,000 smokers' products per minute.

SUMMARY OF THE INVENTION

An object of the invention is to provide an apparatus which can be used with advantage for severing of relatively soft and highly elastic as well as of relatively hard, tough and rather rigid rod-shaped articles, especially portions of filter rods or analogous rod-shaped articles which constitute or form part of smokers' products.

Another object of the invention is to provide a severing apparatus whose knife or knives can cut across rod-shaped articles with a minimum of friction and whose knife or knives are unlikely to jam during severing of articles even if the knife or knives receive motion from relatively small and economical prime movers.

A further object of the invention is to provide a novel and improved apparatus for severing portions of filter rods in machines for the production of filter-tipped smokers' products.

An additional object of the invention is to provide novel and improved means for holding, guiding and otherwise influencing rod-shaped articles during travel past one or more knives, especially disk-shaped rotary knives which serve to subdivide such articles into shorter rod-shaped sections.

The invention is embodied in severing apparatus for at least slightly flexible or bendable rod-shaped articles, particularly for portions of extruded filter rods or analogous articles which constitute to form part of smokers' products. The apparatus comprises a rotary drum shaped member or an analogous conveyor having flutes or other suitable article-receiving means arranged to accept (e.g., directly from a magazine) and to move sideways a succession of parallel rod-shaped articles in a predetermined direction toward, past and beyond a cutting or severing station, knife means (e.g., a rotary disk-shaped knife having a circumferentially complete cutting edge) provided at the cutting station and extending into a portion of the path of sidewise movement of successive rod-shaped articles in the receiving means to thus subdivide the articles into shorter rod-shaped sections (e.g., filter plugs of two times unit length) during movement of articles past the cutting station, and means for flexing or bending the articles in the receiving means, at least while the articles move past the severing station, to thus promote the severing action of the knife means by applying a tensional stress to those parts of successive articles which move along the aforementioned portion of the path of sidewise movement of the articles. The flexing means preferably comprises a plurality of stationary components which can perform the additional function of holding the articles and their sections against uncontrolled movement due to inertia, gravity and/or centrifugal force. Such components are adjacent to the path of movement of articles and sections in the receiving means of the conveyor.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The improved apparatus itself, however, both as to its construction and its mode of operation, together with additional features and advantages thereof, will be best understood upon perusal of the following detailed description of certain specific embodiments with reference to the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a schematic front elevational view of a filter cigarette making machine which embodies the improved apparatus;

FIG. **2** is an enlarged fragmentary axial sectional view of a conveyor of the severing apparatus of FIG. **1**, and further showing the means for flexing rod-shaped articles as well as a rod-shaped article prior to flexing;

FIG. **3** shows the structure of FIG. **2** and the knife which severs the rod-shaped article while the latter is flexed in accordance with one embodiment of the invention;

FIG. **4** is a sectional view as seen in the direction of arrows from the line IV-IV of FIG. **3**;

FIG. **5** is a sectional view similar to that of FIG. **3** but showing different flexing means;

FIG. **6** is a sectional view as seen in the direction of arrows from the line VI-VI of FIG. **5**; and

FIG. **7** is a sectional view similar to that of FIG. **3** or **5** but showing the subdivision of a rod-shaped article into three discrete sections.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **1** shows a filter cigarette making machine of the type known as MAX S produced by Hauni-Werke Korber & Co. KG, Hamburg, Federal Republic Germany. The filter cigarette making machine comprises a frame **5** and is directly coupled to a machine which produces plain cigarettes of unit length. Successive plain cigarettes are introduced into successive peripheral flutes of a rotary drum-shaped row forming conveyor **1** wherein the cigarettes form two rows. The cigarettes in the oddly numbered flutes form a first row which is nearer to one axial end, and the cigarettes in evenly numbered flutes form a second row which is nearer to the other axial end of the conveyor **1**. The plain cigarettes of one row are transferred into successive flutes of one of two rotary drum-shaped aligning conveyors **2**, and successive plain cigarettes of the other row are transferred into successive flutes of the other aligning conveyor **2**. The conveyors **2** rotate at different speeds and/or transport the respective plain cigarettes through different distances prior to transfer of such cigarettes into successive flutes of a rotary drum-shaped assembly conveyor **3**; such transfer takes place at a station T2. Each flute of the assembly conveyor **3** receives two coaxial plain cigarettes of unit length which are spaced apart by a distance least equal but preferably at least slightly exceeding the length of a filter rod section of two times unit length.

The frame **5** of the filter cigarette making machine further supports a magazine or hopper **4** for a supply of parallel filter rod portions of four times unit length. The outlet **4***a* of the magazine **4** receives a portion of a fluted rotary drum-shaped conveyor **6** forming part of a severing apparatus which is constructed and assembled in accordance with one embodiment of the invention. The flutes of the conveyor **6** receive discrete filter rod portions **38** (see FIG. **2**) of four times unit length during travel past the outlet **4***a* and the flutes thereupon transport such filter rod portions past a rotary disk-shaped knife **7** which severs each filter rod portion midway between its ends so that each such portion yields two filter rod sections **44** (FIG. **3**) of two times unit length. The plane of the disk-shaped knife **7** is normal to the axis of rotation of the conveyor **6**.

The thus obtained pairs of filter rod sections **44** of double unit length are transferred into the flutes of two rotary drum-shaped staggering conveyors **8** (only one shown in FIG. **1**) which rotate at different speeds and/or transport the respective sections **44** through different distances in order to move the originally coaxial sections out of axial alignment with each other. The staggering conveyors **8** deliver filter rod sections **44** of two times unit length into successive flutes of a rotary drum-shaped shuffling conveyor **9** which cooperates with one or more stationary cams **9***a* to convert the sections **44** into a single row wherein each preceding section is in exact register with the next-following section. Successive sections **44** of the thus obtained row are transferred into successive flutes of a rotary drum-shaped accelerating conveyor **11** which inserts successive sections into successive flutes of the assembly conveyor **3**. This takes place at a transfer station T1. Such flutes thereupon move past the station T2 to receive pairs of spaced-apart plain cigarettes of unit length so that each flute of the conveyor **3** which advances beyond the station T2 contains a group of three coaxial rod-shaped articles, namely, two plain cigarettes of unit length and a filter rod section **44** of two times unit length therebetween. The conveyor **3** transports such groups between two condensing cams **3***a* which cause the plain cigarettes of successive groups to move nearer to and into abutment with the respective ends of the associated filter rod section **44** of two times unit length. Such groups are transferred into successive flutes of a rotary drum-shaped transfer conveyor **12**.

The frame **5** further supports a spindle **15** for a roll **14** consisting of a convoluted web **13** made of cigarette paper, imitation cork or other suitable wrapping material. The web **13** is withdrawn from the roll **14** by two advancing rollers **16** and moves along a curling device **17** having a relatively sharp edge which extends transversely of the path for the web and eliminates or equalizes internal stresses in the web before the latter reaches the rotary applicator **18***a* of a paster **18**. The applicator **18***a* receives a film of adhesive from a withdrawing roll **18***b* of the paster **18** and applies the adhesive film to the underside of the adjacent portion of the running web **13**. The leader of the web **13** adheres to the foraminous peripheral surface of a rotary suction drum **19** which cooperates with a rotary knife **21** to subdivide the web **13** into a series of discrete adhesive-coated uniting bands. The uniting bands are attached to successive groups of rod-shaped articles in the flutes of the transfer conveyor **12** in such a way that each uniting band extends substantially tangentially of the respective group and adheres to the corresponding filter rod section **44** of two times unit length as well as to the inner end portions of the associated plain cigarettes of unit length.

The frame **5** further supports a second spindle **15A** for a roll **14A** of fresh web **13A** which is automatically spliced to the running web **13** when the supply of web **13** (roll **14**) is nearly exhausted. The splicing operation takes place at the station **20**.

The conveyor **12** transfers successive groups of rod-shaped articles (each of which carries an adhesive-coated uniting band) onto a rotary drum-shaped wrapping conveyor **22** which cooperates with a stationary or mobile rolling device **23** to convolute the uniting bands around the respective filter rod sections **44** of two times unit length as well as around the inner end portions of the associated plain cigarettes of unit length and to thus complete the conversion of such groups into filter cigarettes of double unit length.

Successive filter cigarettes of double unit length are transferred into the flutes of a rotary drum-shaped drying conveyor **24** which causes the adhesive to set prior to transfer of successive cigarettes into the flutes of a rotary drum-shaped conveyor **26** which may but need not be similar to or identical with the aforementioned conveyor **6** for filter rod portions **38** of four times unit length. The conveyor **26** cooperates with a rotary disk-shaped knife **26***a* which severs each cigarette of double unit length midway between its ends (i.e., across the respective filter rod section **44** of two times unit length and across the convoluted uniting band) so that each such cigarette yields two filter cigarettes of unit length. The filter plugs of pairs of filter cigarettes of unit length in successive flutes of the conveyor **26** are adjacent to each other. The conveyor **26** may form part of a first testing device which examines the wrappers of successive filter cigarettes of double unit length and effects segregation of defective cigarettes, e.g., of cigarettes whose wrappers exhibit holes, frayed ends, open seams and/or other defects.

Pairs of coaxial filter cigarettes of unit length are thereupon transferred into successive flutes of a rotary drum-shaped conveyor **27** forming part of an inverting or tip turning device **29**. The latter further comprises a second rotary drum-shaped conveyor **27***a* which receives one filter cigarette of each pair in the flutes of the conveyor **27** and delivers such cigarette to discrete arms **29***a* of an inverting unit serving to turn the cigarette through 180 **degrees prior to introduction into a flute of a rotary drum-shaped conveyor** 28*a*. The conveyor **28***a* delivers inverted filter cigarettes into alternate flutes of a conveyor **28** which also forms part of the tip turning device **29**. The number of flutes on the conveyor **28** is twice the number of flutes on the conveyor **27**; oddly numbered flutes of the conveyor **28** receive non-inverted filter cigarettes from the conveyor **27** and evenly numbered flutes of the conveyor **28** receive inverted filter cigarettes from the conveyor **28***a*. The thus formed single row of filter cigarettes of unit length (the filter tips of all such cigarettes face in the same direction) is transferred into the flutes of a further rotary drum-shaped conveyor **31** forming part of a second testing unit which monitors the tobacco-containing ends of the cigarettes and effects segregation of cigarettes having unsatisfactory tobacco-containing ends (too much tobacco or less than a satisfactory amount of tobacco). The ejection of defective filter cigarettes of unit length preferably takes place during movement in the flutes of a further rotary drum-shaped conveyor **32** which receives cigarettes from the conveyor **31** and delivers satisfactory cigarettes to the upper reach of a conveyor belt **36** trained over several pulleys **34** (one shown in FIG. **1**). The illustrated pulley **34** cooperates with a braking roller **33**. The filter cigarettes which reach the upper reach of the conveyor belt **36** are transported to storage, to a tray filling device, to a pneumatic sender which propels cigarettes into the magazine of a packing machine, or directly into the packing machine, not shown.

Referring to FIG. **2**, the conveyor **6** is a cylindrical drum having equally spaced peripheral article-receiving flutes **37** which extend in parallelism with its axis. The flute **37** which is shown in FIG. **2** is assumed to have been advanced beyond the outlet **4***a* of the magazine **4** and contains a filter rod portion **38** of four times unit length. The depth of the flute **37** increases in a direction from the center (at **39**) toward both ends, i.e., toward the end faces of the conveyor **6**, so that the bottom surface of the flute includes two mutually inclined portions **37***a*, **37***b* which make an angle greatly exceeding 90° but at least slightly less than 180°.

Successive flutes **37** which contain filter rod portions **38** travel along a flexing or bending device which includes two stationary components **41** extending in the direction of rotation of the conveyor **6** and having inwardly extending portions or cams **43** (FIGS. **3** and **4**) whose distance from the periphery of the conveyor **6** is less than the distance between such periphery and the major portions of components **41**. As a filter rod portion **38** approaches the cutting or severing station (shown in FIG. **3**), it is held at three different points, namely, at the center by the apex **37***c* of the bottom surface of the respective flute **37** and at both sides of the center **39** by the inwardly extending portions **43** of the respective flexing components **41**. The central portion of the conveyor **6** has a circumferential groove **42** successive increments of which receive a portion of the circumferentially complete cutting edge of the rapidly rotating knife **7** during travel past the severing station. The flexing or bending action of the components **41** may but need not be such that the end portions of a filter rod portion **38** which is about to be severed contact the outermost parts of the bottom surface portions **37***a*, **37***b*.

The components **41** of the flexing device may be configurated in a manner as shown in FIG. **4**, i.e., they may constitute portions of rings which are concentric with the conveyor **6** and comprise inwardly extending portions or cams **43** with gradual transition between the inner or end surfaces **41***a* of the major portions of components **41** into the inner or end surfaces **43***a* of the cams **43**. The gradual transitions are shown at **41***b*. The extent to which the inner surfaces **43***a* are nearer to the axis of the conveyor **6** than the inner surfaces **41***a* is preferably proportional to the inclination of bottom surface portions **37***a*, **37***b* with respect to each other and to the axis of the conveyor **6**. The components **41** are secured to the frame **5** of the filter cigarette making machine.

The severing operation is carried out as follows:

When an empty flute **37** travels below and along the outlet **4***a* of the magazine **4**, it receives a discrete filter rod portion **38** in such a way that the center of the portion **38** rests on the apex **37***c* between the bottom surface portions **37***a*, **37***b*. Such flute then advances beyond the outlet **4***a* and moves along the inner surfaces **41***a* of the flexing components **41**. Before a filled flute **37** enters the range of the knife **7**, the respective filter rod portion **38** is engaged and flexed by the inwardly extending portions **43** so that it is tensioned in the region located radially outwardly of the apex **37***c*. As the cutting edge of the knife **7** severs that filter rod portion **38** which reaches the severing station, the slit which is formed by the cutting edge expands to form a wedge-like space between the thus obtained filter rod sections **44** (FIG. **3**) of two times unit length. The flexing of successive portions **38** prior to and during severing exhibits several important advantages. Thus, the cut across each portion **38** is cleaner if the cutting edge of the knife **7** severs such portion in a region where the portion **38** is subjected to tensional stresses (as a result of flexing by **37***c* and **43**, **43**). Secondly, the inner end portions of freshly formed filter rod sections **44** move away from the respective sides of the cutting edge so that friction between the knife **7** and sections **44** is reduced to zero (or practically zero) as soon as the severing step is completed.

The manner in which the sections **44** are held in the respective flutes **37** during further transport toward the staggering conveyors **8** of FIG. **1** forms no part of the invention. This can be achieved by extending the components **41** of the flexing device all the way to the transfer station between the conveyors **6**, **8** or by providing the conveyor **6** with suction ports (not shown) which communicate with the flutes **37** at both sides of the respective apices **37***c* and are connected to a suction generating sides as soon as the corresponding flute advances beyond the components **41**.

FIGS. **5** and **6** show a modification of the severing apparatus of FIGS. **2** to **4**. All such parts which are identical with or clearly analogous to those of the apparatus shown in FIGS. **2–4** are denoted by similar reference characters plus **100**. The conveyor **106** has article-receiving flutes **137** of constant depth, i.e., the bottom surfaces of such flutes are parallel with the axis of the conveyor **106** all the way from the one to the other end. The components **141** of the flexing device do not have inwardly extending portions or cams corresponding to

the portions **43** shown in FIGS. **3** and **4**, i.e., their inner or end surfaces **141***a* are located at the same distance from the periphery of the conveyor **106** all the way from the one to the other end of each component **141**, as considered in the circumferential direction of the conveyor **106**.

At the severing or cutting station (where the cutting edge of the rotary disk-shaped knife **107** enters the circumferential groove **142** of the conveyor **106**), the central parts of successive filter rod portions **138** of four times unit length are lifted away from the adjacent portions of the bottom surfaces of the respective flutes **137** by two stationary components or cams **147** which extend into circumferential grooves or recesses **146** of the conveyor **106**. The grooves **146** flank the centrally located groove **142**, and the latter is preferably located midway between the grooves **146**.

When a filter rod portion **138** of four times unit length approaches the severing station, it is held by the inner or end surfaces **141***a* of the two outer flexing component **141** so that its outer ends contact the bottom surface of the respective flute **137**. At the same time, the components or cams **147** lift the central part of such filter rod portion so that the filter rod portion **138** is flexed and tensioned in a region which is located radially outwardly of the groove **142**. Such part of the filter rod portion **138** is severed by the circumferentially complete cutting edge of the knife **107** so that the filter rod portion yields two nearly coaxial filter rod sections **144** of two times unit lenth. The effect of flexing is the same as described in connection with FIGS. **2–4**, i.e., the gap between the sections **144** assumes the shape of a wedge and the inner end faces of the sections **144** are out of frictional engagement with the cutting edge of the knife **107** as soon as the severing step is completed.

FIG. **7** shows a portion of a third severing apparatus. This apparatus employs two preferably coaxial disk-shaped knives **207A**, **207B** which can subdivide rod-shaped articles (e.g., portions of extruded filter rods, each such portion being of six times unit length) into groups of three sections **244** of two times unit length. The conveyor **206** has grooves **242A**, **242B** for the respective knives **207A**, **207B**, axially parallel article-receiving flutes **237** each having a bottom surface consisting of two mutually inclined outer portions **237***a*, **237***b* and a centrally located portion or ledge **237***d* which is parallel to the axis of the conveyor **206** and hence normal to the planes of the two knives. The components **241** of the flexing or bending device engage those parts of the filter rod portion which are about to constitute the outer sections **244** and press such parts toward or against the bottom surface portions **237***a*, **237***b*. This results in generation of tensional stresses in those regions where the filter rod portion is about to be severed by the knives **207A**, **207B**. The apparatus of FIG. **7** reduces friction between the knives and the outer sections **244**. The centrally located section **244** can be engaged by a customary shroud or attracted to the ledge **237***d* by suction.

The apparatus of FIG. **7** can be modified by mounting the knife **207A** ahead of or behind the knife **207***b*, as considered in the direction of rotation of the conveyor **206**. The flexing device then comprises three components **241** or three components **241** and one or two components corresponding to **147** in FIGS. **5–6**, depending on the configuration of bottom surfaces of the flutes. The knife **207A** or **207B** subdivides each filter rod portion of six times unit length into a section **244** and a section of four times unit length, and the knife **207B** and **207A** thereupon subdivides each section of four times unit length into two sections **244**. The just described apparatus constitutes a relatively simple modification of the structure shown in FIG. **7**. Its advantage is that the cutting edges of the knives **207A**, **207B** are out of frictional engagement with the adjacent filter rod sections immediately upon completion of a cut.

The conveyor **26** of FIG. **1** may but need not be associated with a flexing device of the type shown in FIGS. **2–4** or **5–6** (or with analogous flexing means).

An important advantage of the flexing device is that the spreading movement of the inner end face of filter rod sections **44**, **144** or **244** away from each other begins even before the severing step is completed, i.e., as soon as the cutting edge of the knife **7**, **107**, **107A** or **107B** begins to penetrate into the tensioned part of the wrapper of the respective filter rod portion of four or six times unit length. This insures that friction between the inner and faces of the shorter filter rod sections and the respective sides of the knife or knives is either zero or a minute fraction of friction in conventional severing apparatus wherein the filter rod portions lie flat against the bottom surfaces of the respective flutes during travel past the severing station. Reduction or elimination of friction results in the making of cleaner cuts. Moreover, such reduction or elimination of friction reduces the stresses upon the bearings for the knife or knives and upon the means for rotating the knife or knives at an elevated speed.

Without further analyses, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic and specific aspects of my contribution to the art and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the appended claims.

What is claimed is:

1. Severing apparatus for at least slightly flexible rod-shaped articles, particularly for portions of filter rods or analogous articles which constitute or form part of smokers' products, comprising a conveyor having article-receiving means arranged to accept and to move a succession of rod-shaped articles in a predetermined direction sideways toward, past and beyond a cutting station; knife means provided at said station and extending into a portion of the path of movement of successive articles in said receiving means to thus subdivide the articles into shorter rod-shaped sections during movement of articles past said station; and means for flexing the articles in said receiving means, at least while the articles move past said station, to thus promote the severing action of said knife means by applying a tensional stress to such parts of successive articles which move along said portion of said path.

2. Apparatus as defined in claim **1**, wherein said flexing means comprises a plurality of stationary components adjacent to said path of sidewise movement of articles in said receiving means.

3. Apparatus as defined in claim **1**, wherein said conveyor is a rotary member and said receiving means comprises flutes in the periphery of said member, said knife means including a rotary knife located in a plane which is normal to the axis of said member.

4. Apparatus as defined in claim 3, wherein said rotary member is a drum and said knife is a disk having a circumferentially complete cutting edge.

5. Apparatus as defined in claim 3, wherein each of said flutes has a bottom surface including first and second portions located at the opposite sides of said plane and sloping outwardly therefrom toward the axis of said rotary member, said flexing means including first and second components respectively adjacent to said first and second portions of the bottom surfaces of flutes moving toward and past said station and positioned to urge the adjacent portions of articles in such flutes toward the respective portions of the corresponding bottom surfaces.

6. Apparatus as defined in claim 5, wherein said components are stationary and comprise portions which engage and flex portions of articles in successive flutes moving past said station.

7. Apparatus as defined in claim 6, wherein each of said components has a first surface located at a first distance from said path and said portions of said components have article-engaging second surfaces located at a shorter second distance from said path.

8. Apparatus as defined in claim 7, wherein the difference between said distances is proportional to the mutual inclination of the first and second portions of each of said bottom surfaces.

9. Apparatus as defined in claim 5, wherein each of said bottom surfaces has an apex which is located in said plane.

10. Apparatus as defined in claim 9, wherein said first and second portions of each of said bottom surfaces make an obtuse angle of slightly less than 180 degrees.

11. Apparatus as defined in claim 3, wherein said flexing means comprises first and second components located at the opposite sides of said plane and positioned to maintain the neighboring portions of articles in the respective flutes during movement past said station, and at least one additional component extending into the flutes intermediate said first and second components and positioned to maintain the neighboring portions of articles out of contact with the bottom surfaces of the respective flutes during travel past said station so that the articles are flexed in said plane during severing by said knife.

12. Apparatus as defined in claim 11, wherein at least one of said components is stationary.

13. Apparatus as defined in claim 12, wherein said rotary member has two circumferential grooves flanking said plane and communicating with said flutes, said flexing means comprising two additional components each extending into a different one of said grooves and into those flutes which move past said station.

14. Apparatus as defined in claim 1, wherein said knife means has a cutting edge consisting of a material enabling said knife means to repeatedly sever articles which constitute portions of an extruded filter rod consisting at least in part of synthetic plastic material.

15. Apparatus as defined in claim 1, further comprising a magazine containing a supply of rod-shaped articles and arranged to feed such articles directly to said receiving means upstream of said cutting station, as considered in said direction, and additional conveyor means for accepting sections of severed articles from said receiving means downstream of said station.

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